Contents

IN THE EVENT OF ANY INCONSISTENCY BETWEEN THE ANSWERS PROVIDED HEREIN AND THE BROAD AGENCY ANNOUNCEMENT (BAA), THE BAA SHALL TAKE PRECEDENCE

1.0 – Technical Interests

- **Q1.1: What kind of technologies are the Program Managers (PMs) interested in? What kind of new technologies is the Tactical Technology Office (TTO) envisioning?**
  - A1.1: The President's Budget (PB) and the Program Objective Memorandum (POM) initiatives, which can be found online, provide details on the interests of TTO and DARPA. These can be found at http://www.darpa.mil/NewsEvents/Budget.aspx.

- **Q1.2: Is TTO interested in autonomy?**
  - A1.2: Yes. Autonomy is a cross cutting technology within all focus areas (ground, maritime, air, and space).

- **Q1.3: Is TTO interested in portable energy?**
  - A1.3: TTO is interested in how to provide improved capabilities for the warfighter (propulsion, aviation, etc.), but there is no explicit focus on portable energy by itself.

- **Q1.4: Is TTO interested in data analytics/large cloud formation?**
  - A1.4: TTO may be interested in data analytics/large cloud formation as related to ground forces, but that is mostly in the Information Innovation Office (I2O)'s domain. More details on I2O can be found at http://www.darpa.mil/Our_Work/I2O/.

SPACE

- **Q1.5: Who is working communications between space swarms?**
  - A1.5: TTO is pursuing efforts to develop inter-satellite communication systems.

- **Q1.6: What are the top priorities and interests in Space Situational Awareness (SSA)?**
  - A1.6: TTO is looking for a balanced portfolio in Space Domain Awareness between sensor development and data acquisition. TTO is interested in getting more data on things for which data is currently limited or unavailable (not including geosynchronous orbit (GEO)) and looking at data to be able to do indications and warning. This includes knowing in a timely manner if there are new objects in space, if something has been maneuvered, or if something has changed state. TTO is also interested in helping with sensor development/purchasing data.

AIR

- **Q1.7: In Air Dominance (AD), do you include ground based missiles? Have you thought about AD as more than just an air fighter?**
  - A1.7: Yes, we include ground based missiles for AD, but this is an area that is also covered by Air and Missile defense organizations.

- **Q1.8: Can you elaborate on integrated hypersonics?**
  - A1.8: TTO is interested in air breathing and tactical boost glide concepts.

- **Q1.9: Is TTO interested in sensors for detection in characterization, fire control, etc.?**
  - A1.9: TTO is interested in sensors for the counter game, particularly in hypersonics.

MARITIME

- **Q1.10: Are you interested in energy scavenging and thermal management for electronics?**
  - A1.10: Energy scavenging is of interest if motivated by a larger system-level need. TTO is generally not interested in thermal management alone because it is a subcomponent technology, but there could be interest if it is an enabler for something at the system level.

- **Q1.11: What is TTO looking for as far as the scale and scope of a gas gun?**
  - A1.11: TTO is interested in scalable approaches from 35mm – 155mm for a variety of applications. TTO could also tailor higher velocity for the potential to go after supersonic launch, over the horizon, high altitude, etc.

- **Q1.12: Why stop at defense on the land?**
  - A1.12: The maritime domain is a good place to do things relative to space because maneuvering to hard-to-reach places from US soil is difficult. Cross-cutting over domains would be interesting; TTO would like to see ideas.

- **Q1.13: How does DARPA intend to duplicate rail gun Navy work?**
  - A1.13: DARPA is not duplicating anything the Navy has done. The Navy and the Office of the Secretary of Defense (OSD) are looking at near-term implementation of gun systems. DARPA wants to know what the next step is that could dramatically increase the existing capability. Looking at the Navy system and other systems is a good way to mitigate risk. TTO is happy to leverage and build from rail gun work accomplished by others.

- **Q1.14: Is control channel vehicle-to vehicle a TTO function or a cross-cutting DARPA function?**
  - A1.14: TTO will not go after a new radio capability, but will use a system enabler. The Strategic Technology Office (STO) has a suite of programs that specifically deal with communication. More details on STO can be found at http://www.darpa.mil/Our_Work/STO/.

GROUND

- **Q1.15: How do you propose to build an alternative communication framework in terms of security?**
  - A 1.15: There are existing capabilities that will allow DARPA to make robust communications systems through heavy radio frequency (RF) environments and environments where adversaries are trying to interfere. The hope is to mold a capability and loop with the Soldiers and Marines. DARPA challenges other organizations to counter our development.

- **Q1.16: In the Soldier squad focus area, can you comment on similarities/differences between human-machine interactions?**
  - A1.16: Solving the human-machine interaction problem is absolutely crucial for enabling endeavors such as Squad X to work, so TTO is researching what the Soldier is best at and what the robot is best at so they can perform together in the most efficient and effective manner possible. TTO is not necessarily looking for a fully autonomous system that does everything by itself, but wants to provide the squad with the ability to deploy platforms with sensors on board that can detect and neutralize threats. Current autonomy does not take advantage of better sensors and better technologies to become more capable as time moves on.

- **Q1.17: Can you provide specifics on tagging, tracking, and locating?**
  - A1.17: TTO is interested in anything that will provide better situational awareness.

- **Q1.18: The focus of the ground systems programs emphasizes the dominate phase of conflict. What about the other phases? Is there interest in ideas for other phases, such as deter or seize the initiative?**
    - A1.18: Yes, the TTO ground system portfolio is interested in technologies that improve warfighter effectiveness at all phases of military operations.

2.0 – Solicitation Process and Program Creation

- **Q2.1: Can more than one executive summary be submitted per company?**
    - A2.1: Yes.

- **Q2.2: Will you post statistics on the total number of white papers, executive summaries, and proposal submissions that TTO receives?**
    - A2.2: No; information related to submissions to the BAA is considered source selection sensitive.

- **Q2.3: Will the PM sidebar sessions at the TTO Proposers' Day replace an executive summary or white paper?**
    - A2.3: No; the sidebar session will not replace a submission to the BAA. The purpose for the PM sidebars is maximizing the ability to communicate with the PMs and determine if someone is interested in your idea. All ideas should be submitted following the procedures highlighted in the BAA.

- **Q2.4: Can proposers propose a multiphase program?**
    - A2.4: Yes.

- **Q2.5: How do the PMs plan to make a business case (BC) for future programs?**
    - A2.5: TTO is looking for business cases that answer the following, and expects program managers to explain new efforts in technical and business rationale:
        - What is the overall Rough Order of Magnitude (ROM) cost for the development?
        - Heilmeier questions – how is it going to reduce life cycle cost to the Department of Defense?
        - What is the business model (from a business perspective)?
        - What are the quantitative impacts as well as qualitative impacts?
        - How will the technology transition to the Services? How will the technology synergize with Service needs?

- **Q2.6: What kind of timelines do the PMs have for their business cases?**
  - A2.6: TTO understands that strategic surprise does not often have a business plan. The objective of the business case is to determine the future of the activities that are being worked, which means that the business cases developed by PMs may evolve. From a taxpayer standpoint, the PMs need to have the ability to defend their developments, and should be able to visualize how something would be used and assess the relative value to existing capability. For example, for stealth, one could assess reduction in losses for a specific target.

    That being said, TTO is still interested in anything that will create or prevent strategic surprise, even if it does not currently have a business plan.

3.0 – Contracts and Teaming

- **Q3.1: Does TTO prefer direct contract vehicles?**
  - A3.1: The contract vehicle utilized depends on the type of effort.

- **Q3.2: Can you elaborate on partnerships with the Services?**
  - A3.2: DARPA always encourages the PMs to get Service collaboration. This does not mean that a program will not be started because the PMs do not have a Service partner up front; high payoff/high risk efforts will most likely be pursued, even without Services collaboration.

- **Q3.3: Can you elaborate on how you identify an "A-Team"?**
  - A3.3: TTO will extensively review the proposed teams' background and qualifications in accordance with evaluation criterion #5 – Proposer's Management Capabilities and/or Related Experience.

- **Q3.4: Can DARPA programs and the National Aeronautics and Space Administration (NASA) work together?**
  - A3.4: TTO has a very strong history of collaboration with NASA.

- **Q3.5: Will DARPA help facilitate a relationship between manufacturers and small businesses?**
  - A3.5: DARPA does not directly facilitate teaming. DARPA has helped with that process before, but does not mandate anything or set guidelines.

- **Q3.6: Where does university research fit in?**
  - A3.6: Universities are not excluded from teaming; some PMs are currently working with university teams. University research may start as a seedling that turns into a larger effort as it moves forward.

4.0 – Budget

- **Q4.1: Are there set-asides/reserves for small businesses?**
  - A4.1: There is no specific TTO budget allocation for small businesses; TTO is simply looking for the best ideas for national security.

- **Q4.2: How much funding is available for Phase I studies in the TTO budget?**
  - A4.2: TTO cannot provide a specific amount for available funding. Funding is made available from different sources, including funds from existing program budgets if an effort is identified as being beneficial to an existing program.

5.0 – Other

- **Q5.1: What is TTO's strategy to deal with Anti-Access Area Denial (A2AD) threats?**
  - A5.1: DARPA is embarking on an Air Dominance initiative, which includes at least four offices with enabling systems and technologies (TTO, STO, I2O and MTO) as well as coordination with USAF and USN programs.

- **Q5.2: What kind of student support is TTO exploring?**
  - A5.2: TTO's focus is on national security and prototypes; while TTO is a supporter of science, technology, engineering, and mathematics (STEM) education, TTO is currently more interested in endeavors that directly support national security and prototypes.

- **Q5.3: In today's budget-constrained environment, how important is it to find transition of technology to the warfighter? How quickly does TTO feel the need to transition?**
  - A5.3: Transition is always of interest, but TTO is especially interested in the next leap ahead and looking further out to create strategic surprise. Other organizations can focus on rapid execution to the warfighter tomorrow.

- **Q5.4: How are technologies developed with other offices at DARPA?**
  - A5.4: The collaboration among offices is generally started by the PMs and from the Office Director/Deputy Director listening to other Office Directors. TTO will take any great idea from within the agency; there are some really interesting things going on with which TTO wants to get involved. There is no fixed process for how this happens.

- **Q5.5: Does TTO want to extract the human out of warfare?**
  - A5.5: TTO cannot extract human beings out of warfare. Humans need to make human decisions, but a machine may be faster at executing.

- **Q5.6: What is the status of the orbital debris removal initiative that DARPA sponsored a few years ago?**
  - A5.6: TTO is still very interested in orbital debris removal and is continuing to solicit ideas, but is still waiting for a submission that fully answers the questions and takes the full picture into consideration (e.g., finding debris at centimeter level accuracy, removing debris without impacting anything else, etc.). The proposals that have been received to date do not include the full spectrum from start to finish.

- **Q5.7: How different is the approach of Squad X from Net Warrior, and what outcomes do you expect?**
  - A5.7: While TTO is looking at the Net Warrior capabilities, TTO is more interested in communication and networking solutions. With the compression of videos and control of robots, the bandwidth requirements and dynamic spectrum agility requirement will most likely force TTO to move away from the hardware of Net Warrior.

- **Q5.8: Regarding Squad X, when are you crossing the line with overburdening the Soldier with too much information?**
  - A5.8: Currently, the loads that Soldiers are required to carry cause physical and cognitive performance to go down. Squad X addresses this by enabling the capability to successfully "drive and text" at the same time. It will also address visual constraints by moving "beyond vision." Vision is too heavily relied upon, and it becomes an overburden very quickly. Leveraging different modalities would address this issue. TTO wants to examine how a squad leader can make better decisions more quickly.